



UNIVERSITÄT ZU LÜBECK
INSTITUT FÜR MEDIZINISCHE INFORMATIK
NACHWUCHSGRUPPE MOVEGROUP

Announcement Master, Bachelor and Study Thesis

Online data stream processing

Description:

Manual assessments in clinics provide only a snapshot of a patient's condition. Continuous monitoring of physical performance and other clinical parameters allows for long-term measurements and more frequent assessments that can improve diagnosis and treatment [1].

The online processing of data streams (e.g. using Kafka and Spark) enables soft real-time data evaluation and intervention control in medicine [2]. Following on from existing work, a data stream processing system is to be refined.

Server-side processing algorithms are to be expanded and, if necessary, partially outsourced to upstream end devices (e.g. smartphones). The aim is also to integrate the analysis results into existing apps / decision support systems. The programming can be done in Python or Java, depending on the orientation of the work.

This thesis can be designed with respect to the following topics:

- Construction of an online data stream processing system for the analysis of clinically relevant properties from multiple sensor modalities.
- Application of different approaches for real-time data analysis
- Coding of clinically relevant outcomes for integration into HIS/decision support systems.

In case of a student research project or similar, a connecting thesis is possible.

Keywords: online data processing system, AI in medicine, streaming, gait analysis, activities of daily living, wearables, decision support

Start: Immediately or by arrangement.

[1] Jessilyn Dunn, Lukasz Kidzinski, et al., Wearable sensors enable personalized predictions of clinical laboratory measurements, 2021 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8293303/>) [2] Ramadan, Fawzya, Real-Time Healthcare Monitoring System using Online Machine Learning and Spark Streaming, 2020 (https://www.researchgate.net/publication/344585102_Real-Time_Healthcare_Monitoring_System_using_Online_Machine_Learning_and_Spark_Streaming).

If you are interested and have any questions about this topic, please feel free to **book an appointment** via: <https://calendly.com/fudickar/>



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Medical Informatics Initiative Junior Research Group

Integration and Analysis of Multimodal Sensor Signals and Clinical Data for Diagnostics and
Investigation of Neurological Movement Disorders (MoveGroup)

Further thesis topics at: move.ulü.de